REMARKS

The rejection of claims 16-18, 20-27, 30-32, and 36-37 under 35 U.S.C. 112, second paragraph, is obviated by appropriate amendment.

Claim 16 has been amended to recite the final step of generating transgenic plants.

Claim 16 has also been amended to recite clear antecedent basis for the term "transformants" in (a1) and (a2).

In claim 16, (b), line 1, "the use of" has been inserted between "by a" and "peroxidase".

In claim 16, (b), line 3, "said" has been inserted between "and" and "peroxidase".

In claim 16, (c), line 1, the term "the selected transformants" now has clear antecedent basis in claim 16, (a1), as amended.

In clam 16, (c), line 2, the term "plantlets" now has clear antecedent basis in claim 16, (c), line 1, as amended.

Claim 16, (d), has been amended to obviate the objection set forth by the Examiner on page 3, lines 1-2, of the Office action.

In claim 16, (d), line 3, as amended, the term "said sorted plantlets" finds antecedent basis in claim 16, (d), line 1, as amended.

Claim 16, (d), reference to "transgene" has been deleted.

While an objection was made to the term "gene of interest" in claim 20, it is presumed that claim 23 was intended. Accordingly, claim 23 has been amended to define the gene of interest.

In, claim 20, line 3, the term "wherein oxidation of said substrate is accompanied by a change of color" has been deleted.

Finally, it is submitted that claims 31, 32, 36, and 37 properly depend from claim 16.

In view of the above amendments are remarks, Applicants respectfully submit that the amended claims are definite within the meaning of 35 U.S.C. 112, second paragraph. Withdrawal of this ground of rejection is therefore respectfully requested.

Claims 16-27, 30-32, and 36-37 were rejected under 35 U.S.C. 112, first paragraph as containing subject matter not described in the specification in such a way as to enable one skilled in the art to which it pertains to make and/or use the invention.

The rejection is obviated in part by appropriate amendment, and traversed in part.

The rejection indicates that it is unpredictable that a method of detection using an H_2O_2-producing protein gene would function as desired because all plants would or could demonstrate positive detection events. In support of this conclusion, the Buchanan et al. reference was cited for the proposition that all plants contain in their metabolic machinery proteins which produces H_2O_2.

The Applicant does not agree with the reasoning and conclusions reached in this rejection.

Firstly, it should be noted that Buchanan et al. was published *after* the filing date of this application and, according to MPEP 2164.05(a), such a post-filing date reference should not be used to demonstrate that the patent is non-enabling. Exceptions to this rule could occur if a later-dated reference provides evidence of what one skilled in the art would have known on or before the effective filing date of the patent application." Clearly there is no evidence in the record to support such a finding.

Furthermore, the Applicant submits that the Buchanan et al. reference is not relevant in this case, for the following reasons. According to Buchanan et al., "H_2O_2 is produced by

peroxisomal oxidases" (page 32, column 2, paragraph 1.9.1, title) and that these "peroxisomal oxidases" correspond to the "oxidases of peroxisomes" (page 32 column 2, last paragraph). It is also described that "catalase is always present in the peroxisome" (page 31, column 2, lines 30-32). Furthermore the title 1.9.1 (page 32 in bold character) is "The toxic H_2O_2 produced by peroxisomal oxidases is **destroyed in situ** by catalase" (emphasis provided). So, it is clear that, inevitably, this H_2O_2 is destroyed and could not be detected.

Furthermore, it is specified in page 33, column 1, first paragraph,of Buchanan et al. that "because catalase is always present in peroxisomes, the harmful H_2O_2 generated by these flavoprotein oxidases **is broken down immediately within the organelle** and never reaches the cytoplasm" (emphasis provided).

Accordingly, the argument set forth in the rejection that "all cells of all plants would or could demonstrate positive detected events" is clearly erroneous.

With regard to the enablement issue described in the Office action as the "sorting" issue, claim 16 has been amended in order to specify that the sorting of the transgenic plantlets in step (d) is carried out according to the phenotypic characters of the transgenic plantlets containing the pRi of *Agrobacterium rhizogenes* which exhibit in particular crinkled leaves and shorter internodes, and the transgenic plantlets which do not contain the pRi of *Agrobacterium rhizogenes* which dio not exhibit crinkled leaves and shorter internodes. Support for this amendment is found in the specification at page 13, lines 18-21.

It is, however, further stated in the Office action that the Applicant:

> "merely provides prophetic examples of a method of *Agrobacterium rhizogenes* transformation of Brassica napus stems, tomato, tobacco, or cauliflower with a plasmid pH100, production of root tissue and possible identification of H_2O_2 producing tissue using a colorimetric assay. Applicant has not provided a single exemplified example of the claimed invention. No results of experimental work are given."

To the contrary, Applicants clearly have exemplified the present invention. In particular, Example 1.1 (Transformation of rape with the wheat germin gene and selection of the transformants by a colorimetric test on the root), and Example 2 (Use of the peroxidase-based selection method for obtaining transgenic plants (rape) expressing a second gene of interest: the gene encoding a protein with endochitinase activity), **are complete working examples**.

The Patent Office has the initial burden to establish a reasonable basis to question the enablement provided for the claimed invention. In particular, the Office must provide a reasonable explanation as to why the scope of protection provided by a claim is not adequately enabled by the disclosure. *In re Wright*, 999 F.2d 1557, 1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993). A specification disclosure which contains a teaching of the manner and process of making and using an invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented must be taken as being in compliance with the enablement requirement of 35 U.S.C. 112, first paragraph, unless there is a reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support. *Id.*

In this case, the Office has not provided any objective reasoning as to why the method could not work with other plants or genes.

Indeed, it is well settled that the specification need not disclose what is well-known to those skilled in the art and preferably omits that which is well-known to those skilled and already available to the public. *In re Buchner*, 929 F.2d 660, 661, 18 USPQ2d 1331, 1332 (Fed. Cir. 1991); *Hybritech, Inc. v. Monoclonal Antibodies , Inc .*, 802 F.2d 1367, 1384, 231

USPQ 81, 94 (Fed. Cir. 1986), cert. denied, 480 U.S. 947 (1987); and *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1463, 221 USPQ 481, 489 (Fed. Cir. 1984).

Making a construct/vector is routine for the person skilled in the art, and is in fact classical molecular biology.

Using *Agrobacterium rhizogenes* for transformation is known from 1982 (Chilton M.D. et al. *Nature,* 1982, 295, 432-434).

The person skilled in the art also knows which cells or plants to use, and the Applicant has described different examples in the application with regeneration from explants.In addition to those exemplified in the present patent application, other, non-limiting examples of dicotyledonous plant species transformed with *Agrobacterium rhizogenes* and described in the literature are:

Invited review: Use of Ri-mediated transformation for production of transgenic plants

Author: Christey M.C.

Source: In Vitro Cellular and Development Biology - Plant, November 2001, vol. 37, no. 6, pp. 687-700(14)

Publisher: CABI Publishing

Abstract:

Agrobacterium rhizogenes-mediated transformation has been used to obtain transgenic plants in 89 different taxa, representing 79 species from 55 genera and 27 families. A diverse range of dicotyledonous plant families is represented, including one Gymnosperm family.

Source : Planta. 1996 Sep;200(1):119-24.

Title : The response to auxin of **rapeseed (Brassica napus L.)** roots displaying reduced gravitropism due to transformation by Agrobacterium rhizogenes.

Authors : Legue V,iss-Ecole D, Maldiney R, Tepfer M, Perbal G.

Source : 10th Crucifer Genetics Workshop, ISHS Symposium on Brassicas, Rennes, France, 23-27 September 1997,

Title : Genetic transformation of **cauliflower** by Agrobacterium rhizogenes

Authors : R. Grison, S. Lauras, M. Barthes, M. Pagniez and A. TOPPAN

Source : Plant Physiol. 1993 Jun;102(2):363-371.

Title : Hormonal Characterization of Transgenic Tobacco Plants Expressing the rolC Gene of Agrobacterium rhizogenes TL-DNA.

Authors : Nilsson O, Moritz T, Imbault N, Sandberg G, Olsson O.

Source : Plant Science 1987 49,37-49

Title : Transformation of tomato using an Ri plasmid vector

Authors : Morgan A.J. Cox P.N. Turner D.A. Peel E. Davey M.R. Gratland K.M.A. Mulligan B.J.

Source : Canadian Journal of Botany; 69 (12): p. 2709-2715; 1991

Title : Axenic culture of the downy mildew fungus Plasmopara halstedii in Agrobacterium rhizogenes-induced roots of sunflower (Helianthus annuus).

Authors : Zahka, G.A.; Viranyi, F.

Copies of any or all of these publications will be provided upon request.

Numerous examples of genes encoding an H_2O_2 producing protein have been cited in the specification (page 4 lines 13-27) and it is also indicated that these genes could be used for the purposes of the present invention.

Finally, the Applicant does not understand the citation in the Office action of the Tisserat reference (page 5 of the Office Action) for the proposition that "the regeneration of

plants from explants is unpredictable and explant selection is critical for successful plant regeneration". The Tisserat reference was published in 1985, and clearly cannot be used to show the state of knowledge in this art at the time the present application was filed.

In view of the above, Applicant respectfully submits that one of ordinary skill in the are is able to practice the claimed invention without an undue amount of experimentation. Accordingly, withdrawal of the rejection under 35 U.S.C. 112, first paragraph, is urged.

The rejection of claims 16, 19, 24, 25, 30, 32, and 37 under 35 U.S.C. 103(a) as being unpatentable over Simpson et al. in view of Zhang et al. is respectfully traversed.

The inventiveness of the presently claimed method, as amended, is based on the combination transformation by *Agrobacterium rhizogenes* and visual selection of the transformants, based on colouring, according to a hydrogen peroxide based colorimetric test.

Such a method is nowhere disclosed or suggested in the prior art of record, which was discussed in Applicant's response filed on April 23, 2004. Applicant's remarks made in the response with respect to the Simpson et al. and Zhang et al. references are now incorporated herein by reference.

Accordingly, the Applicant reasserts that the Simpson et al. and Zhang et al. references, when taken as a whole for what they individually and in combination reasonably teach one of skill in this art, do not disclose or render obvious the claimed invention, as amended.

In view of the deficiencies in the art, none of the present claims are *prima facie* obvious, and, accordingly, withdrawal of the rejections under 35 U.S.C. 103(a) is respectfully requested.

Applicant respectfully submits that the present invention is now in condition for

allowance. Early notification to that effect is earnestly solicited. If any final points remain that can be clarified by telephone, Examiner Helmer is encouraged to contact Applicant's attorney at the number indicated below.

Applicants hereby petition the Commissioner for Patents to extend the time for reply to the notice dated October 20, 2004, for one (1) month from January 20, 2005, to February 20, 2005. A duly completed credit card authorization form is attached to effect payment of the extension fee.

Respectfully submitted

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